Given Function: y = $\sqrt{6\cdot x-18}$ Given Point (12,0)

Objective Function: (not expanded) D(x) = $\sqrt{(x-12)^2+(\sqrt{6\cdot x-18}-0)^2}$

There are no roots of Objective Function

Objective Function: (expanded) D(x) = $\sqrt{x^2-18\cdot x+126}$

Derivative of Objective Function D'(x) = $\frac{x-9}{\sqrt{x^2-18\cdot x+126}}$

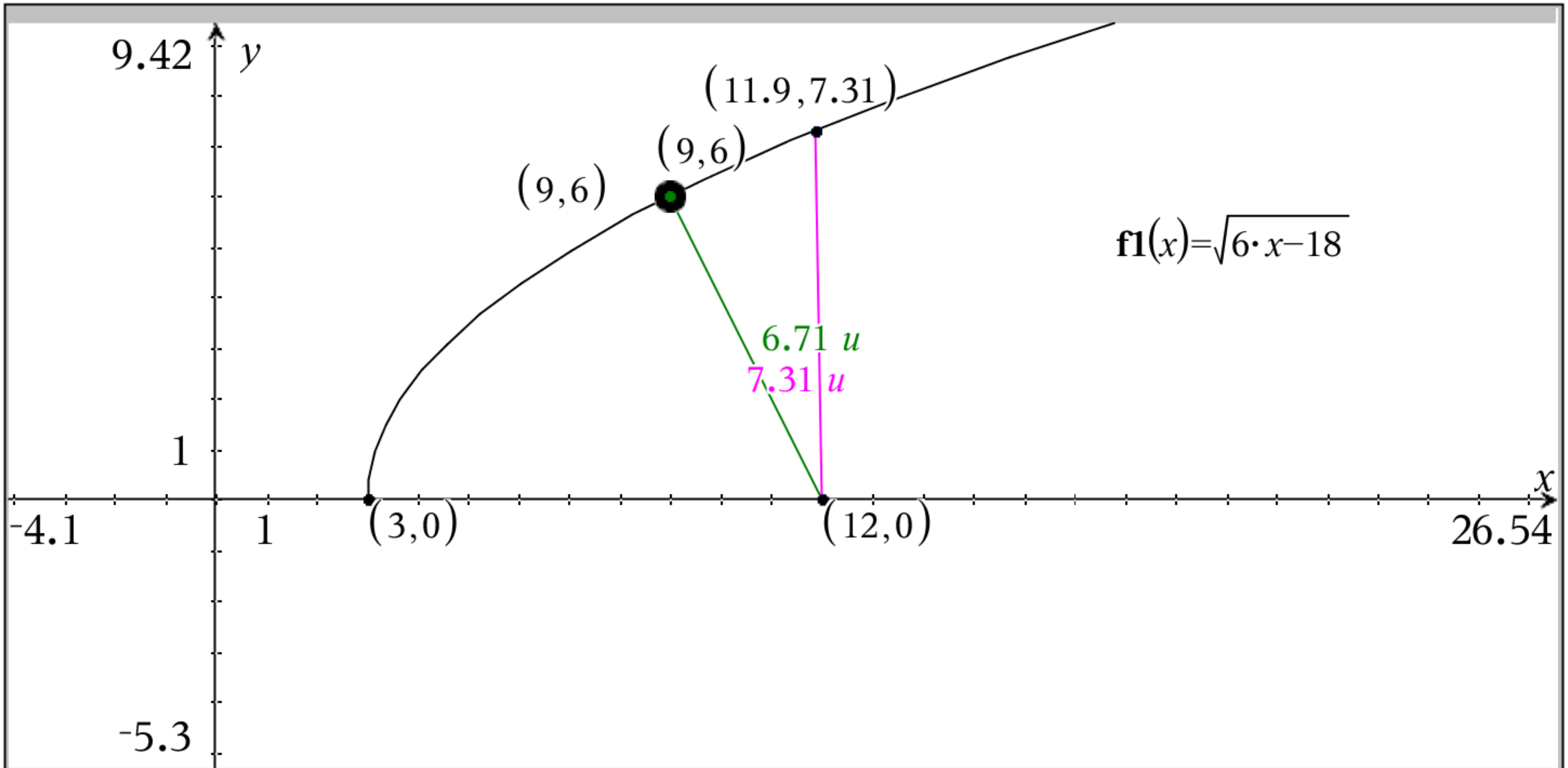
Roots of Derivative Function x = 9

Closest Point on the Given function to the fixed point at (12,0)

is at x = 9 and y = $\sqrt{6\cdot 9-18} = 6 \approx 6.$ or $(9, \sqrt{36})$

The minimum distance from the fixed point (6,0) to the given function is

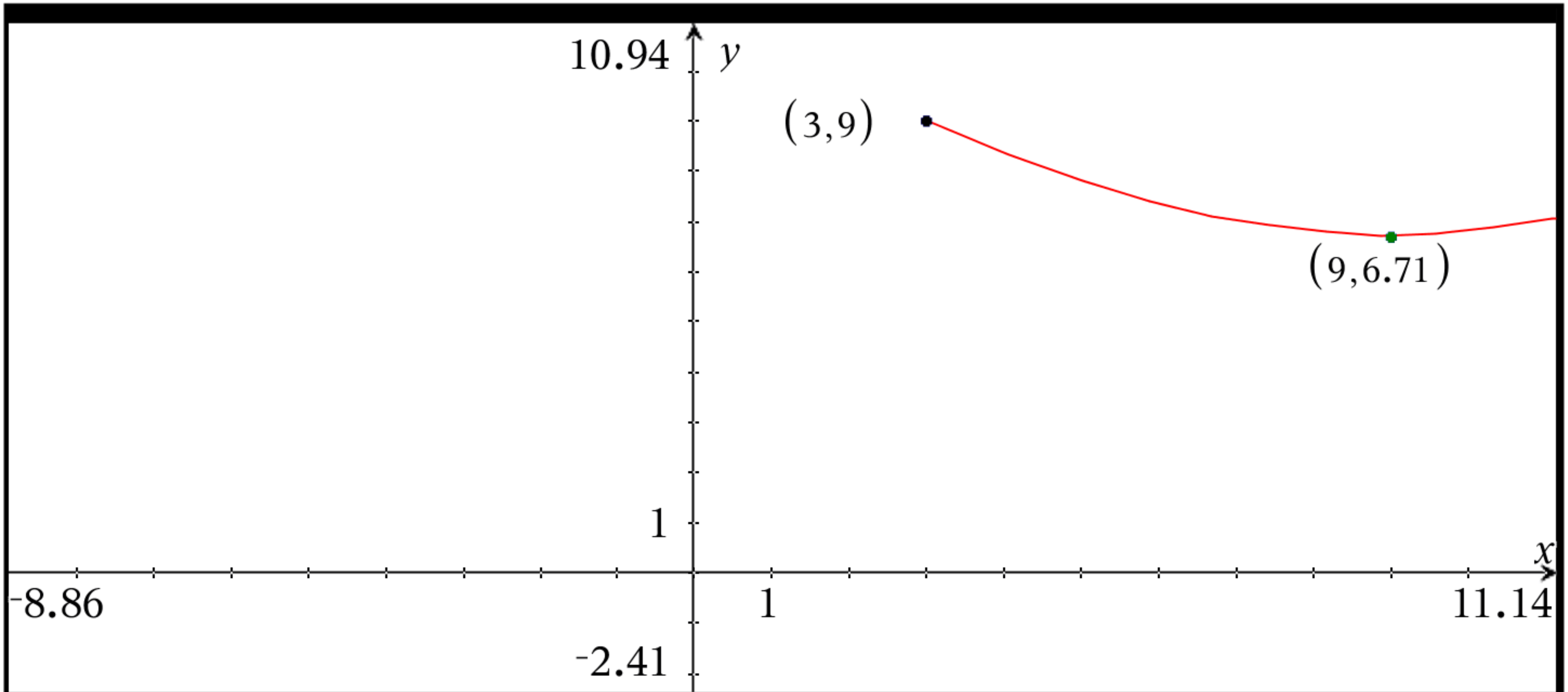
D(9) = $3\cdot\sqrt{5} \approx 6.71$



any_x =11.9

The graph on the graph above is the given function

$y = \sqrt{6\cdot(x-3)}$

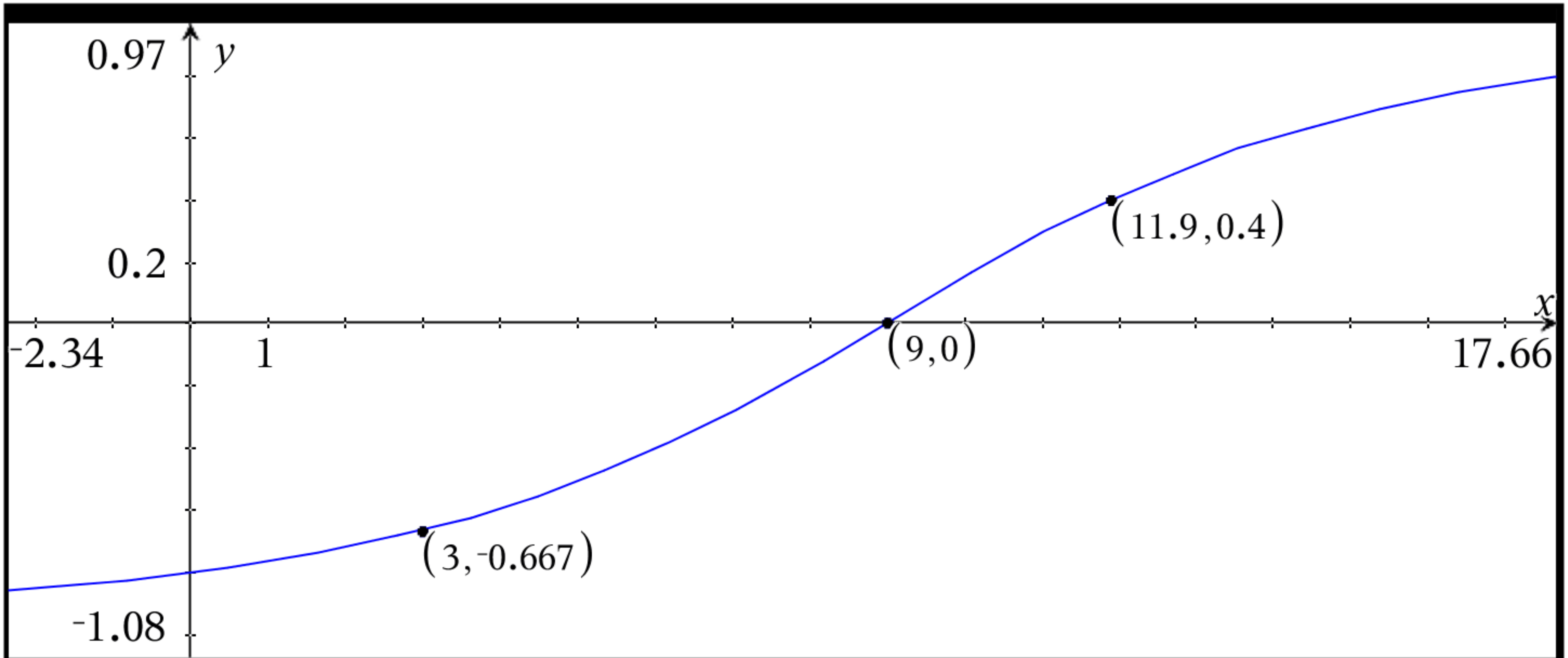


< > any_x =11.9

The graph above is the distance function the measures distance from fixed point (6,0) to the given function y = $\sqrt{6\cdot(x-3)}$

The graph of the above is the distance function

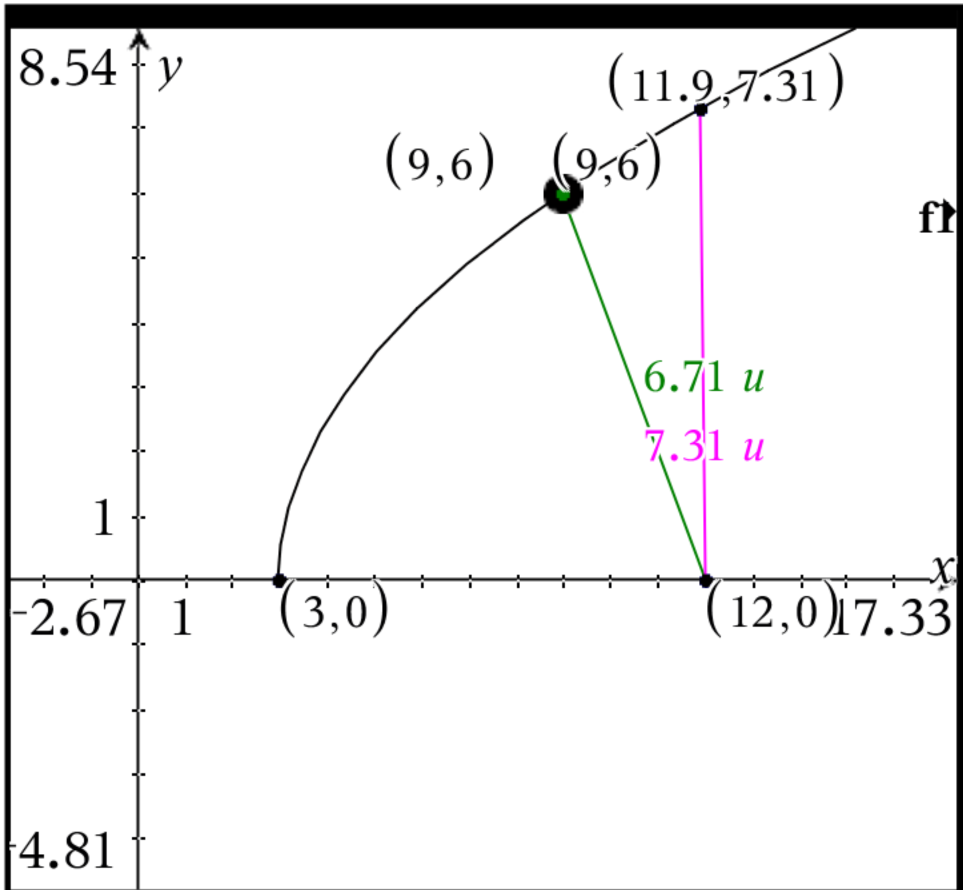
D(x) = $\sqrt{x^2-18\cdot x+126}$

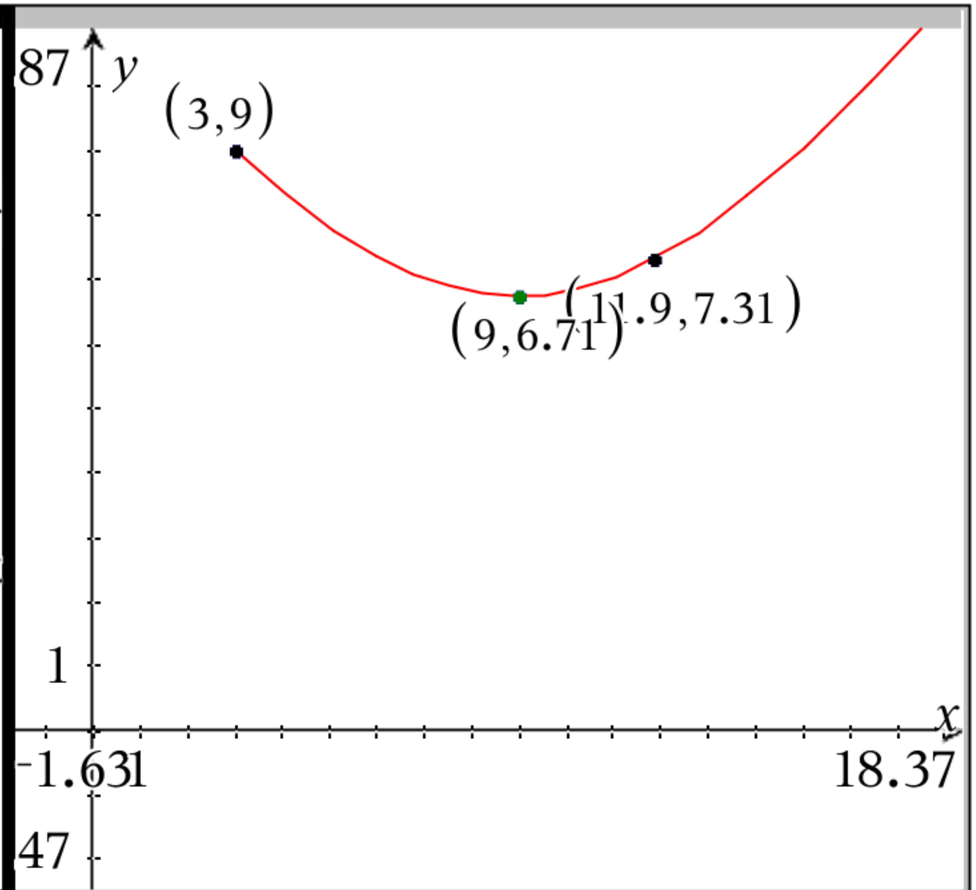


any_x =11.9

The graph of the above is the derivative of the distance function

$$D'(x) = \frac{x-9}{\sqrt{x^2-18\cdot x+126}}$$





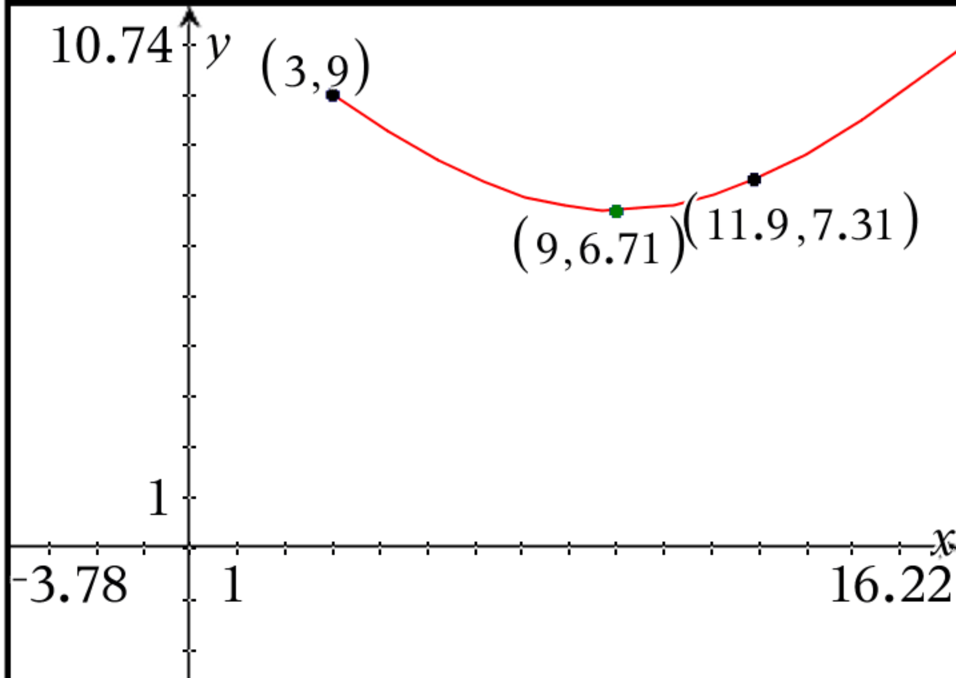
any_x =11.9

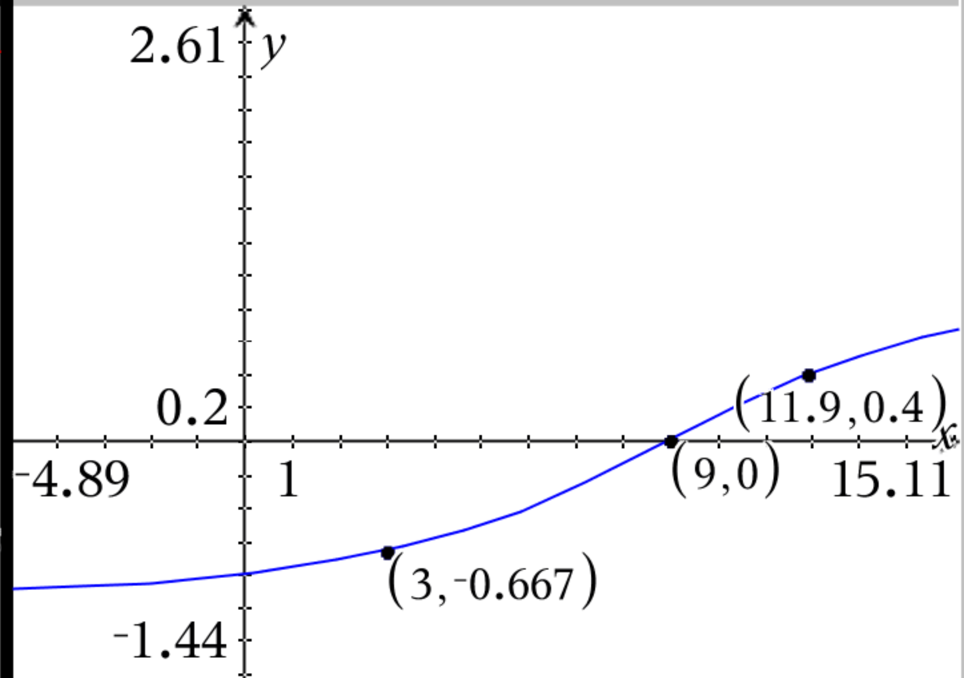
The graph on the left is the given function

y = $\sqrt{6\cdot(x-3)}$

The graph of the right is the distance

function D(x) = $\sqrt{x^2-18\cdot x+126}$





any_x =11.9

The graph on the left is the distance function y = $\sqrt{x^2-18\cdot x+126}$

The graph of the right is the derivative of the distance function

$$D'(x) = \frac{x-9}{\sqrt{x^2-18\cdot x+126}}$$